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UC SALTON— A NEW CULTIVAR OF ALFALFA FOR LOW DESERT VALLEY AREAS OF SOUTHERN CALIFORNIA

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UC Salton, a new cultivar of alfalfa developed by the University of California Agricultural Experiment Station, has resistance to the low desert valley summer disease complex and to Phytophthora root rot. UC Salton is purple-flowered, upright-growing, and recovers rapidly after cutting. The cultivar was named after the Salton sea, which is located in its area of adaptation.

UC Salton is the fifth generation of a broad-based germplasm pool developed under conditions where there was severe natural selection for root rots and the spotted alfalfa aphid. Germplasm was from many sources including old adapted cultivars, unadapted cultivars, and selected lines from the UC breeding program. New seed sources were added to the germplasm pool each generation. Seed was produced on heavily planted broadcast stands in areas 0.07 and 0.69 hectares (⅙ acre to 1.7 acres) in size. Essentially no insecticides were used.

The area of adaptation for UC Salton is the low desert valley areas of southern California where the summer disease complex is important and winter forage is desired. Yield of UC Salton in relatively disease-free experiments was equal to or better than all other cultivars at El Centro, good at Five Points in only one test, but variable at Davis.

UC Salton has better resistance to the spotted alfalfa aphid biotype Ent F than Mesa Sirsa and Sonora. It has resistance to the pea aphid which is slightly lower than two cultivars but better than all others. It is expected to be susceptible to most leaf and stem diseases.

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UC SALTON— A NEW CULTIVAR OF ALFALFA FOR LOW DESERT VALLEY AREAS OF SOUTHERN CALIFORNIA[1]

INTRODUCTION

UC Salton is a new cultivar (variety) of alfalfa having some resistance to stand-depleting factors found in low desert valley areas of southern California. Researchers of the University of California Agricultural Experiment Station developed it by using a broad germplasm base and natural and artificial selection in the severe environment of the low desert valleys of California.

Stand reduction has been recognized for a long time as an important problem of alfalfa in low desert valleys of California (Lehman, *et al.* 1968). In the past (until about 1960), alfalfa in these areas was treated much like an annual crop because stand loss during the late summer was always very severe. For example, alfalfa was usually planted in the fall of the year and peak production was obtained in May and June. As temperatures increased in the summer, stands weakened and danger of stand loss was very great. Most alfalfa growers stopped irrigating alfalfa during the end of July or irrigated sparingly for 2 to 4 weeks longer to produce a crop of seed. In about mid-September the old alfalfa fields would be renovated (lightly tilled with curved shanks spaced about 8 inches apart), leveled, seeded, and then irrigated sometime after the first of October. Many of the old, dehydrated alfalfa plants would recover slowly and grow with the newly planted seedlings to start a crop of alfalfa for the coming year.

The practice of drying and renovating was gradually discontinued as leveling and irrigation techniques improved and as the acreage of Moapa and newer cultivars increased. However, stand reduction during the late summer continued to be a severe problem. Plant loss during summer was caused by flooding injury (scald) and Rhizoctonia root rot, as well as the weakening effects of high summer temperatures, previous attacks from Phytophthora root rot, and perhaps other undertermined diseases (Erwin, 1956; Erwin, *et al.*, 1959; Erwin, 1971; Lehman, *et al.*, 1968; Smith, 1943, 1945). This group of summer problems will be referred to as the "low desert valley summer disease complex." Phytophthora root rot is an important stand-depleting disease in the low desert valley areas, but most damage from this disease seems to be caused in these areas in fall, winter, and spring (Erwin, 1971). Since most of the stand-depleting diseases are associated with excess water, stand loss could be reduced by good land leveling and by careful irrigation, but resistant cultivars were needed to provide additional protection especially in low areas in the field, ends of the field, and at times when excessive water was applied by accident or rainfall.

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UC Salton has a level of field resistance to the low desert valley summer disease complex and should provide more protection from this complex than any other cultivar used in the area to date.

PARENTAGE AND DEVELOPMENT

UC Salton is the fifth generation of a broad-based germplasm pool developed under conditions where there was severe natural selection for root rots and the spotted alfalfa aphid. Germplasm was from many sources including old adapted cultivars, unadapted cultivars, and selected lines tracing to individual plants in the UC breeding program. New germplasm was added each generation to broaden the germplasm base and to include genes believed necessary to increase its adaptation and resistance to diseases and insects. This "open-ended" method of developing a germplasm pool was judged better for our purposes than starting with a very broad base and gradually narrowing the germplasm by selection for specific characteristics, as was done by Hanson *et al.* (1972) in the development of pools A and B. This also made it possible to work with nearly adapted germplasm and slowly improve and broaden the germplasm pool without affecting it adversely. However, Hanson *et al.* suggested a method of developing germplasm pools which employed the addition of new germplasm in a systematic manner once in about every 5 years, which was less frequent than done in the development of UC Salton.

Except for the first few generations, an effort was made to retain at least 75 to 85 per cent of the germplasm from the present or previous generations. New germplasm additions were made on the basis of their (1) resistance to diseases and insects, (2) nondormancy, (3) special characters, and (4) germplasm diversity. Larger amounts of resistant and nondormant germplasm were used in order to maintain or increase characters judged as important in California, and to keep possible detrimental genes at a minimum level.

Seed harvested from germplasm pools was handled in two ways: (1) seed mixtures were made which would produce seed for the next generation of the germplasm pool, (2) further selections were made in the greenhouse and field. All selected plants were eventually planted in the field and severely rogued for disease and insect susceptibility, and for any characteristics that might make an undesirable parent. Seed from these sub-pools was incorporated into later generations of the germplasm pool and occasionally tested further for use on their own merits.

Seed mixtures used to produce the next generation of germplasm pools were planted in 0.07-hectare (1/6-acre) blocks for the first two generations and in 0.69-hectare (1.7-acre) blocks in hay-production fields in all subsequent generations.

Seed of the next germplasm pool generation was planted in October at a rate of 28 kilograms (25 pounds) or more per hectare. Hay was produced on this field until the cutting made in about May or June. From this time the field was treated as a seed field until hay production was started again about 3 months later. During the seed-

PERCENTAGE OF UC SALTON AND ITS PROGENITORS

Name	Year planted and generation	Per cent seed by generations	Seed origin
UC 30	1962 (generation 1)	11.5 per cent	Rhizoctonia resistant selections from African.
		24.2 per cent	Mixture of 30 cultivars.
		64.3 per cent	Selections resistant to the spotted alfalfa aphid from African, (African × Lahontan) × African and (African × Lahontan) × African.[2]
—	1963 (generation 2)	53.0 per cent	Seed from generation 1.
		14.4 per cent	Selections resistant to the spotted alfalfa aphid from African and (African × Lahontan) × African.[2]
		4.6 per cent	Epley (probably of African origin).
		27.9 per cent	Equal amounts of African, Hairy Peruvian, Indian, and Arizona 21-5.
UC 31	1964 (generation 3)	75.0 per cent	Generation 2 (25.2%) and selections from previous generations (49.8%).
		23.3 per cent	Selections resistant to the spotted alfalfa aphid from African and (African × Lahontan) × African.[2]
		0.7 per cent	Aphidor.
		1.0 per cent	Sirsa.
UC 37	1965 (generation 4)	94.4 per cent	Generation 3 (66.1%) and selections from previous generations (28.3%).
		5.4 per cent	Vernal, Narragansett, Lahontan, Cody, Moapa, African, Sonora, and five adapted experimental cultivars.
		0.2 per cent	White-seeded line from California Common.
UC Salton (UC 52)	1966 (generation 5)	88.7 per cent	Generation 4 (76.6%) and selections from previous generations (12.1%).
		10.7 per cent	Sirsa.
		0.6 per cent	White-seeded line from California Common.

production period the field received fewer irrigations and there was little or no control of insects.

All generations except generation 2 were tested for yield in an effort to monitor yield and maintain an acceptable level. In the development of UC Salton, yields about equal to Sonora were maintained as shown by the following yield data where progenitors of UC Salton are compared to Sonora expressed as 100 per cent.

Cultivar	*Yield*
Test 22-23E planted 11/9/64	
UC 30 (generation 1)	100
Sonora	100
Moapa	96
Test 35-36E, planted 9/26/65	
UC 30 (generation 1)	99
UC 31 (generation 3)	109
Sonora	100
Moapa	94
Test 53-54W, planted 10/26/66	
UC 31 (generation 3)	100
UC 37 (generation 4)	104
Sonora	100
Moapa	84

A level of about 5 per cent below the best adapted cultivar was arbitrarily considered as the minimum acceptable yield level because it appeared by selecting plants with good combining ability from within the germplasm pool, yield could be increased by 5 per cent. Since no selection for combining ability was done in UC Salton, it seems some increase could be made for this character as well as others by re-selection within UC Salton.

The climatic and field conditions under which the germplasm pools were grown were severe in many respects. This contributed to rapid plant losses, and reduced the contribution of germplasm from many of the weak or susceptible plants to the next generation. The soils on which the germplasm pools were planted were clay and clay loam with EC values (electrical conductivity, EC $\times 10^6$ of a saturated soil extract at 25°C) between 1.5 and 13 mmhos per cm in the 0- to 90-cm (0-to-3-foot) areas where most of the roots were located (Lehman *et al.*, 1968).

Average daily high and low air temperatures during the winter (December and January) are 21 to 4°C (70 and 40°F), respectively; during the summer (July and August) they are 41 and 24°C (106 and 76°F), respectively. Average annual rainfall is about 7.5 cm (3 inches) per year, making it necessary to irrigate all alfalfa.

Naturally occurring populations of the spotted alfalfa aphid were often large during the fall and winter after new alfalfa stands were planted, and were able to kill most susceptible plants in a stand (Nielson, *et al.*, 1970). Because of this and other stand-depleting factors mentioned below, it is impossible to know how many plants from susceptible cultivars added to the germplasm pools survived to produce seed. Root rots resulting from over-irrigation, flat land, heavy soils, and untimely rains further depleted the population. Seed insects were able to eliminate or reduce the contribution of plants by preventing flowering and/or seed production. Plants were also killed or weakened by plant competition in the heavily planted fields, by winter-dormant plants growing with non-dormant, high soil salinity, and high temperatures.

The development of UC Salton is an example of using severe environmental conditions to exert selective pressure on undesirable genes in a population and develop resistance or tolerance to a set of characters. The rate of improvement can be increased by using artificial selection and systematically

selecting or roguing within these populations, saving only plants which have some resistance or tolerance to the characters of interest. The rate of improvement will be increased or be more noticeable where little previous work has been done and a greater amount of improvement is possible. If the environmental effect on seed production *per se* is minimal, seed can be produced on large populations without additional work. This will maintain a broad base. If selections must be made in a non-seed-producing area and transported to another area for seed production, the population that can be handled will be reduced and the germplasm base will be narrowed.

Advanced germplasm pool generations of UC Salton are being produced using the methods described above. To date UC 66 and UC 76 have been produced and appear good. New germplasm additions are being made from seed with resistance to the Arabian source of Phytophthora resistance and the stem nematode (Lehman *et al.*, 1969*a;* Lehman *et al.*, 1969*b*). The period between the mixing of new germplasm pools and the age of stand from which seed is produced is being lengthened in an effort to increase stand life.

YIELD

UC Salton was tested for forage yield under relatively normal conditions at El Centro, Davis, and Five Points, California. This was necessary to determine if good production is possible in the relative absence of the insects and diseases to which UC Salton is resistant. UC Salton was similar to or slightly better than all other cultivars in the trials at El Centro (table 1). Yield of UC Salton at Davis was slightly lower than Moapa 69 in both trials but variable in relation to the other cultivars common to the two

TABLE 1
YIELD OF EIGHT ALFALFA CULTIVARS COMPARED TO UC SALTON IN TWO TRIALS AT EL CENTRO, CALIFORNIA, FROM 1969–1972*

Cultivars used	Per cent yield each year†			Average per cent yield
First trial	*1969*	*1970*	*1971*	
UC Salton	100	100	100	100
Sonora	92	92	93	93
Mesa Sirsa	95	92	94	94
El Unico	95	94	100	96
Bonanza	97	95	101	98
El Camino Brand	92	92	98	93
Niagra N71 Brand	99	93	103	98
Caliente	96	103	96	98
Second trial	*1970*	*1971*	*1972*	
UC Salton	100	100	100	100
Mesa Sirsa	99	93	89	94
Hayden	98	91	87	93
Niagra N71 Brand	98	100	92	97

* Plots were seeded in 4-row plots with rows 20 cm. (8 inches) apart, 3.6 meters (12 feet) long, and replicated six times. Four cutting dates (2 early, 1 mid-season, 1 late) were used to represent the year. This schedule was used because a high correlation ($r = 0.95$) was found between the 4-cut schedule and all cuts.

† Yields expressed in per cent of what UC Salton yielded, with UC Salton yield arbitrarily rated 100 each year (e.g., in 1969 Sonora yielded 92 per cent of the UC Salton yield for that year).

trials (table 2). These differences seem to be due to natural variability often obtained between trials. However, more testing is necessary to determine if UC Salton is well adapted as far north as Davis. In other tests, desert-developed cultivars such as Sonora, Mesa Sirsa, and El Unico seem to be less well adapted than Moapa 69 and El Camino at Davis.

In one experiment at Five Points, California, UC Salton was similar to or better than other cultivars in the test (table 3).

TABLE 2

YIELD OF ALFALFA CULTIVARS IN TWO TRIALS AT DAVIS, CALIFORNIA, 1970–1972

Cultivars used	Tons of dry hay produced per acre and hectare per year							
	1970		1971		1972		Total	
	tons per acre	metric tons per hectare	tons per acre	metric tons per hectare	tons per acre	metric tons per hectare	tons per acre	metric tons per hectare
First trial*								
UC Salton	3.59	8.0	8.82	19.8	8.93	20.0	21.34	47.8
Moapa	3.61	8.1	8.89	19.9	9.59	21.5	22.09	49.5
Moapa 69	3.74	8.4	9.04	20.3	10.03	22.5	22.81	51.2
El Unico	3.92	8.8	9.15	20.5	8.94	20.0	22.01	49.3
El Camino Brand	4.03	9.0	9.26	20.8	9.58	21.5	22.87	51.3
Second trial†								
UC Salton	..	..	4.85	10.9	10.34	23.2	15.20	34.1
Moapa	..	..	4.13	9.3	10.11	22.7	14.24	32.0
Moapa 69	..	..	4.53	10.2	11.66	26.1	16.19	36.3
UC SW44	..	..	4.53	10.2	9.86	22.1	14.39	32.3
El Unico	..	..	4.56	10.2	9.58	21.5	14.14	31.7

* Three, six, and seven cuttings were made for 1970, '71, and '72, respectively.
† Five and seven cuttings were made for 1971 and '72, respectively.

TABLE 3

YIELD OF UC SALTON AND FIVE OTHER ALFALFA CULTIVARS GROWN AT FIVE POINTS, CALIFORNIA

Cultivars used	Tons of dry hay produced per acre and hectare per year					
	1971		1972		Total	
	tons per acre	metric tons per hectare	tons per acre	metric tons per hectare	tons per acre	metric tons per hectare
UC Salton	8.17	18.3	14.89	33.4	23.06	51.7
Moapa	7.42	16.6	13.42	30.1	20.84	46.7
Moapa 69	7.59	17.0	13.85	31.1	21.44	48.1
Hayden	7.64	17.1	13.28	29.8	20.92	46.9
El Unico	6.81	15.3	13.98	31.3	20.79	46.6
Sonora 70	7.45	16.7	14.18	31.8	21.63	48.5
LSD (.05)*	1.13	2.5	NS†	NS†	1.70	3.8

* Least significant difference at the 95 per cent level of confidence.
† No significant difference.

REACTION TO LOW DESERT VALLEY SUMMER DISEASE COMPLEX AND PHYTOPHTHORA ROOT ROT

UC Salton and other adapted cultivars were tested in a hay field near El Centro, California, which was over-irrigated by increases in frequency and application time. Plant loss first occurred in mid-July and continued through summer (fig. 1). Problems identified in the field at that time were flooding injury (scald) and Rhizoctonia root rot. In this trial UC Salton was superior to other named and released cultivars in plants per square foot, green weight, and plant height (table 4, fig. 2). No additional yield data were taken from this trial because under the existing conditions little or no alfalfa survived in the other named cultivars (fig. 1).

In a field near Woodland, California, which was mismanaged by first becoming too dry and then being over-irrigated, the stand of UC Salton after this treatment was equal to or better than all other cultivars in the trial.

In this field, plots were 3 × 6 meters (10 × 20 feet) in size; they were planted January 11, 1972, and repli-

Fig. 1. Effect of over-irrigation on cultivar trial. Plants in UC Salton, UC 66, and UC 60 remained alive (cultivars in the first three dark strips front to back) under conditions which killed most of the plants in Niagra N71 Brand, Sonora, Bonanza, Moapa, El Camino Brand, Mesa Sirsa, and El Unico (cultivars in light-colored areas).

Fig. 2. Hay samples of UC Salton and four other cultivars of alfalfa from a cultivar trial planted in an over-irrigated hay field near El Centro, California.

cated three times. Results were as follows:

Cultivar used	*Stand evaluation score*
UC Salton	1.8
Moapa	2.7
Moapa 69	2.7
Washoe	1.5
Lahontan	2.0
Caliverde 65	4.7
Germain's Eldorado R	2.3
DeKalb Brand 183	2.8
Niagra N78 Brand	3.3
AS 13	2.7
AS 49	3.5
Joaquin 11	2.8

The least significant difference at the 95 per cent level of confidence (LSD [.05]) was 1.06.

Plots were scored on a scale of 1 to 5, with 1 = good, 3 = average, and 5 = poor.

UC Salton was compared with other cultivars of alfalfa for resistance to *Phytophthora megasperma* (Phytophthora root rot) in field experiments at Davis, California (table 5), and at the University of Minnesota, St. Paul (table 6). Survival and per cent of plants resistant was higher for UC Salton than for Mesa Sirsa, Moapa, Moapa 69, Saranac, and Vernal, but lower than Lahontan and MP-A2. Reaction of UC SW44 was similar to UC Salton.

Although UC Salton's resistance to Phytophthora root rot is low, it is enough to be valuable in field conditions.

TABLE 4

DATA ON ALFALFA CULTIVARS GROWING IN AN OVER-IRRIGATED HAY PRODUCTION FIELD NEAR EL CENTRO, CALIFORNIA*

Cultivars used	Green weight per plot 8-4-71		Average height of 150 plants 8-4-71		Plants per 0.09 square meters 10-13-71‡
	kilograms	*pounds*	*centimeters*	*inches*	
UC Salton	5.99	13.2	41	16.3	4.5
Sonora	2.68	5.9	24	9.6	0.0
Moapa	3.13	6.9	26	10.3	0.1
Mesa Sirsa	4.45	9.8	28	11.0	2.8
El Unico	3.50	7.7	24	9.6	0.6
Bonanza	3.41	7.5	23	9.0	1.7
El Camino Brand	4.00	8.8	24	9.6	0.4
Niagra N71 Brand	3.31	7.3	24	9.6	0.4
LSD (0.5)†	2.18	4.8	11	4.5	1.0

* Plots were 6 × 18 meters (20 × 60 feet) in size, planted October 9, 1970, and replicated 3 times. Problems identified were primarily flooding injury (scald) and Rhizoctonia root rot.

† Least significant difference at the 95 per cent level of confidence.

‡ Average of eight 0.09-square-meters per plot (8 sq. ft.).

TABLE 5

SURVIVAL AND REACTION OF ALFALFA CULTIVARS EXPOSED TO *PHYTOPHTHORA MEGASPERMA* IN A FIELD TEST AT DAVIS, CALIFORNIA, IN 1972

Cultivars used	Per cent plants surviving test	Per cent plants resistant
UC Salton	80.6	13.8
Mesa Sirsa	66.5	6.2
Moapa	60.8	3.5
Moapa 69	55.1	4.0
Lahontan	93.7	79.4
UC SW44	66.8	15.1

TABLE 7

STAND EVALUATIONS OF ALFALFA CULTIVARS IN TWO TESTS GROWN AT THE UNIVERSITY OF CALIFORNIA IMPERIAL VALLEY FIELD STATION, EL CENTRO

Cultivars used	Per cent stand 56W trial†	Number plants per 0.09 square meter A-80 trial‡
UC Salton	68	7.3
Sonora	52	6.4
Mesa Sirsa	46	6.1
El Unico	39	–
Moapa	–	7.5
Bonanza	35	5.6
El Camino Brand	51	6.6
Niagra N71 Brand	52	5.1
Caliente	60	–
LSD (.05)*	35	1.9

* Least significant difference at the 95 per cent level of confidence.

† Based on number of 15-centimeter (6-inch) spaces with one or more living plants in plots, 1 × 3.6 meter (3.3 × 12.0 ft.) in size. The experiment was replicated 6 times.

‡ Based on number of plants in 3.24 square meters (36 sq. ft.).

TABLE 6

REACTION OF UC SALTON AND STANDARD CHECK CULTIVARS TO *PHYTOPHTHORA MEGASPERMA* IN A FIELD TEST AT ST. PAUL, MINNESOTA.*

Cultivars used	Per cent plants in severity classes§			Average severity
	1 + 2‖	3 + 4	5 + 6	
UC Salton	17.3	66.3	16.3	3.59
Lahontan	36.2	46.5	17.3	3.14
Saranac†	7.3	53.6	39.1	4.26
Vernal†	12.4	49.2	38.5	4.09
MP–A2†	53.6	37.1	9.3	2.69
LSD (.05)‡				0.36

* Data from Dr. D. K. Barnes and Dr. F. I. Frosheiser, USDA, and the University of Minnesota, St. Paul, Minnesota.

† Check cultivars were included twice (8 replications instead of 4).

‡ Least significant difference at the 95 per cent level of confidence.

§ Plants scored 1 to 6: 1 = no symptoms, 6 = plant dead.

‖ Plants scored 1 + 2 are considered resistant.

Stand performance data were obtained from two normally irrigated tests near El Centro, California, to determine stand longevity in the absence of important disease problems (table 7). In both trials, UC Salton was similar to or better than other cultivars in the tests.

REACTION TO SPOTTED ALFALFA APHID, PEA APHID, DOWNEY MILDEW, AND STEMPHYLIUM LEAF SPOT

Resistance of UC Salton to the spotted alfalfa aphid biotype Ent F is equal to that of Bonanza and Niagra N71 Brand but better than Moapa, Sonora, Mesa Sirsa, and the other cultivars in the test. Damage scores of nine cultivars of alfalfa evaluated in El Centro in 1968 for resistance to a field population of Ent F of the spotted alfalfa aphid were as follows:

Cultivar used	*Damage score*
UC Salton	1.2
Sonora	2.8
Mesa Sirsa	2.8
El Unico	2.0
Moapa	4.8
Bonanza	1.7
El Camino Brand	2.8
Niagra N71 Brand	1.3
Caliente	3.2

The cultivars were scored on a 1 to 5 basis with a score of 1 rated good and having no damage and a score of 5 rated poor and having 90 to 95 per cent of the plants in the plot killed.

UC Salton was found to have some resistance to pea aphids in trials at El Centro and Five Points (table 8). UC Salton had slightly more susceptibility to the pea aphid than did El Camino Brand and Niagra N71 Brand, but had more resistance than most of the other cultivars.

Our data indicate that desert-developed UC Salton is susceptible to downy mildew (table 9). It may have some resistance to Stemphylium leaf spot (table 9), but is expected to be susceptible to other leaf and stem diseases.

TABLE 8

DAMAGE SCORES OF ALFALFA CULTIVARS EVALUATED FOR RESISTANCE TO FIELD POPULATIONS OF PEA APHID AT TWO LOCATIONS IN CALIFORNIA

Cultivars used	Damage Scores†			
	A-60 trial‡	A-80 trial‡	WSFS-1 trial§	WSFS-2 trial§
UC Salton	2.00	2.65	1.88	2.40
El Unico	3.00	–	3.00	4.80
Hayden	–	–	3.38	4.90
Mesa Sirsa	2.80	3.85	–	–
Moapa	2.65	2.85	2.50	3.90
Moapa 69	–	–	2.50	4.20
Sonora	3.35	3.00	–	–
Sonora 70	–	–	3.38	5.00
Bonanza	2.80	3.15	–	–
El Camino Brand	1.65	2.50	–	–
Niagra N71 Brand	1.65	1.85	1.50	–
LSD (.05)*	0.80	0.70	0.50	0.56

* Least significant difference at the 95 per cent level of confidence.
† Score of 1 = good, 5 = poor.
‡ Trial at El Centro.
§ Trial at Five Points. WSFS-1, moderate to severe infestation; WSFS-2, very severe infestation.

TABLE 9
REACTION OF ALFALFA VARIETIES TO DOWNY MILDEW AND STEMPHYLIUM LEAFSPOT

Cultivars used	Reaction rating*		
	Downey mildew		Stemphylium leafspot
	Tulare County†	San Benito County‡	San Benito County
UC Salton	2.5	2.9	2.5
Moapa	3.8	–	–
Moapa 69	2.8	2.9	3.4
Mesa Sirsa	1.5	2.1	4.5
El Unico	1.7	–	–
Sonora	–	2.9	3.5
Hayden	1.3	2.4	4.8
UC SW44	–	3.3	1.5
Bonanza	1.0	–	–
El Camino Brand	1.8	–	–
Niagra N71 Brand	1.6	–	–
Caliente	1.6	–	–

* Rating of 1 = good, 5 = poor.
† Data obtained from W. R. Sallee, former Farm Advisor, Tulare County.
‡ Data obtained from E. Byer, Farm Seed Research Corp., San Juan Bautista, California.

ADAPTATION, SEED PRODUCTION, AND CERTIFIED SEED CLASSES

For hay yield, UC Salton is best adapted to low desert valley areas where the summer disease complex and Phytophthora root rot are important factors in stand reduction. It may also be adapted to areas of the San Joaquin Valley in and south of Fresno County but more testing is needed. Tests are being conducted to determine if UC Salton will be adapted to other areas of the southwestern U. S.

No comparative data on seed production with Moapa, Mesa Sirsa, and other cultivars have been obtained to date, but fields producing breeder and foundation seed of UC Salton have produced well.

Under seed certification the classes of seed will be breeder, foundation, and certified. Breeder seed will be used to establish fields for production of foundation seed. Foundation seed will be used to establish fields for production of certified seed. There will be no registered seed class. Breeder seed will be maintained by the University of California, Department of Agronomy and Range Science, Davis, California. If the supply of breeder seed should be depleted, a lot of foundation seed originating from breeder seed shall be set aside and used to produce the subsequent foundation seed. The maximum eligibility of a stand of UC Salton to produce a given class of seed will be determined by the certifying agency in the state where it is certified; otherwise, certification requirements are the same as for other alfalfa cultivars.

Foundation seed of UC Salton can be obtained from the California Crop Improvement Association for seed production. Certified seed will be available to growers for hay production by the fall of 1973.

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To simplify the information, it is sometimes necessary to use trade names of products or equipment. No endorsement of named products is intended nor is criticism implied of similar products not mentioned.

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